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TREASURY DEPARTMENT

GOLD MARKET REPORT
TO THE
UNITED STATES DEPARTMENT OF THE TREASURY

by
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Report on the World Production, Marketing
and Use of Gold

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THE PRODUCTION, MARKETING AND USE OF GOLD

The Context

A rational analysis and evaluation of the functioning world gold market and the supply-demand-price outlook for gold should begin from four basic assumptions: (1) the price of gold must ultimately be determined by the cost of production, including allowance for return on capital, and the demand curve of industrial consumers; (2) the entire stock of gold, above and below ground, is in process of ultimate conversion into end products whose economic value exceeds that of the raw material; (3) all of the existing above-ground stock of gold bullion -- including government reserves -- is, by definition, held for speculative motives, apart from a minimum level of industrial inventories and the small portion of government stocks that might be justified as a strategic industrial reserve; (4) rational holders of gold will sell or not sell at any given time depending on the relationship between the present price, the interest cost, and the expected range of future prices.

The above assumptions are obvious to some, absurd to others, but are simply truisms that apply to all world mineral resources that exist in finite quantity. Gold will only be produced -- whether by state-owned or private enterprise -- if there is an expectation that the selling price will exceed production costs in real terms. This has been true in the past, is true now, and will continue to be true in the future. There is no intangible or mystical value of gold or any other commodity that is not ultimately subject to market determination.

The bulk of the current gold supply is produced by private entrepreneurs who are concerned with return on capital investment, wage rates and union contracts, market prices, interest rates -- the same problems that concern businessmen producing other basic commodities.

On the demand side industrial buyers of gold -- the mainstay of the market -- are concerned with price, cost of possible substitutes, and market demand for the products they sell. There is, of course, some price speculation by those holding a temporary interest in gold on futures exchanges and elsewhere, just as there is on other commodities. In short, in its basic market aspects the price of gold is determined in the same way as the price of other commodities.

The great increase in the volume of gold traded through private markets in recent years and the institutional structure of the market that has evolved reflects a changed situation. Only a decade ago practically all world gold movements were directly or indirectly under the control of the monetary authorities of a relatively few countries. No private gold bullion market of any consequence existed anywhere. The major world central banks had a virtual monopoly on the world gold trade including sales for industrial use. In recent years all that has changed. The central banks no longer play a significant direct role in the world gold market. Virtually all gold production moves directly to end use or to non-government temporary holders through the structure of the private market. In the changed order of things governments who hold gold in the form of "official" reserves are both conceptually, and as a practical matter, in the same boat with private gold holders. The two-tier concept has passed into history and all producers, holders, and users of gold are now, willy-nilly, part of the market process and subject to its constraints and decisions.

One obvious conclusion immediately evident from the basic change in the international structure of gold trading is that the price will be that required to "clear" the market, to balance supply and demand over the long run. The price of gold -- like other world-traded commodities -- can be extremely volatile over the short run depending on various temporary factors. But in a free market over the longer run (and in the long run all markets are "free") the price of gold will be determined by the profit to producers relative to alternative uses of capital on the

one hand, and market demand for industrial use⁽¹⁾ on the other. No rational producer -- public or private -- will mine gold if the required capital resources can more profitably be employed elsewhere. No rational investor or speculator (the terms are interchangeable) will hold gold unless the expected monetary return in real terms is at least equal to alternative investment choices. And no rational commercial user will buy gold unless it can be converted into a product which can be sold at a profit in a competitive market. Taken together these three fundamental factors mean that over time the price of gold will be determined by the cost of production, including allowance for return on capital, and the demand curve of consumers.

(1) The definition of industrial use in this report is a comprehensive one including all purchases of bar gold for resale in other than bullion or bullion coin form.

The Production and Use of Gold 1850-1975

An historical overview

The production of gold in large quantities is a relatively recent historical development. About 80 per cent of all gold production has been mined since 1900 and nearly half of the total in the past 30 years. In the entire history of gold production and use, three dates are particularly significant: 1849 when the California discovery began a long era of large-scale gold production; 1933 when the coinage of gold in quantity ended and gold ceased to be a circulating monetary instrument; and 1968 when the two-tier market effectively ended the international gold standard and made private gold trading at flexible prices first possible.

The great expansion of world gold production in the latter half of the 19th century created a surplus sufficiently large for practical use as coin in the world's circulating money supply. However, the rapid rise in commercial needs during and after World War I outpaced the available new supply of gold and compelled the phasing out of gold as a circulating monetary instrument. The halting of open convertibility by the United States in 1933 marked the practical end of the monetary gold era. No gold coins were minted anywhere for general circulation after that year.

Although the surplus supply of gold was no longer sufficient for general monetary use, the limited amounts in official stocks were considered adequate for use as reserves in settling international balances. The international gold exchange standard was formalized in the Bretton Woods Agreement at the end of World War II. Under this arrangement all currencies were in theory convertible into all others at relatively fixed exchange rates with gold as the common denominator for measurement. For the system to function, at least one country had to serve

as a link between other currencies and gold, with unlimited buy-sell convertibility into gold at a fixed price. As the wealthiest country at the time, the United States volunteered to take on the job. The arrangement continued through the 1960's, when a diminishing gold reserve finally forced the United States in 1971 to resign from its kingpin role. Since no other country was willing or able to take on the job, the international gold exchange standard came to an end.

1850-1933

Until well into the 19th century gold was an exotic mineral rare enough to sustain a consistently high market value, although its practical use was limited to decorative purposes. Gold was not available in sufficient quantity or with enough regularity of supply to function as the basis of any organized monetary system. From the beginning of recorded history until 1850, total world gold production is estimated at less than 150 million ounces⁽²⁾. In the United States less than 2 million ounces of gold was produced during the entire period from 1792 until 1849⁽²⁾. Of this limited gold production only a minor portion was retained in unencumbered government reserves, practically all of it was held by individuals in the form of jewelry or coins.

In the middle of the 19th century the gold supply-demand situation suddenly and drastically changed. With the successive discovery of new fields in California, Australia, Alaska and South Africa, the production of gold accelerated rapidly. From 1850 until 1933 world gold production totaled over 900 million ounces, a third of which was produced in the United States. The great bulk of this gold production was converted into coin, mainly by Great Britain and the United States. Nearly 350 million ounces was minted into British sovereigns and some

(2) Annual Reports of the Director of the U. S. Mint.

220 million ounces into U.S. coins. The minting of gold coins by other countries is estimated at about 150 million ounces.

For most of this period the rising supply of gold was sufficient to keep pace with an expanding world economy. Although the relationship between gold supply and transaction needs was largely coincidental, it gave impetus to establishing gold coinage as the basis for most of the world monetary system. During and after World War I, world economic activity accelerated rapidly and it became evident that the new supply of gold at a fixed price was no longer consistent with money supply needs. By 1933 the coinage of gold had ended and gold ceased to be a significant part of the world's circulating money supply.

Considering the supply-demand status over the entire period from 1850, when large-scale gold production began, to 1933 when its general monetary function effectively ended, one important factor seems obvious. The price of gold could not possibly have been maintained at the established level over this long period in the absence of strong and consistent government support -- mainly by Great Britain and the United States, the two countries which acquired and converted into coin most of the world's gold production until 1933. The open coinage price was at a sufficient premium over production costs to encourage an expansion of gold output while discouraging more widespread commercial use.

The long period of government price-fixing created an illusion -- which to some extent still persists -- that the price of gold is inherently stable and immune from market cost factors that affect all other commodities. If the policy of unlimited government purchases at a price well above production costs had not been adopted, gold after 1850 would probably have behaved much like silver, with new production sources rather quickly dropping the price to marginal production cost levels.

1934-1967

For over a century prior to 1933 a few world powers -- mainly Great Britain and the United States -- pegged the price of gold at an arbitrary fixed level substantially above production costs through open and unlimited coinage of practically all gold production. For most of this period general price indexes were rising relative to gold so that the profits of gold producers, while substantial, were gradually narrowing. By the 1920's the profit squeeze was taking effect and world gold production was showing signs of levelling out. In 1929 commodity prices began a deep slide. Gold alone had government price support and gold producer profits again widened. By early 1933 the real price of gold was close to its historic high, more than 50 per cent above the 1929 level.

In a series of actions beginning in March 1933 and ending in January 1934, the United States Government, for domestic policy reasons, raised the already high gold price support level by an additional 60 per cent in current dollars. The hope was that the higher gold price would stimulate a comparable rise in the depressed level of other commodity prices and an expansion in domestic production.

Although the arbitrary increase in the support price of gold had little effect on economic activity in general, it had a substantial and prolonged impact on the production and industrial use of gold for the next three decades. The 1934 gold price, in real terms nearly 2 1/2 times the level of the 1920's, triggered an expansion in gold production which carried into the 1960's.

World gold production rose from 25 million ounces in 1933 to nearly 40 million ounces in 1939. Restrictions on production during World War II together with rising costs curtailed gold output which by 1945 had dropped to just over 26 million ounces. In the 1950's another surge in gold production began which reached its peak in 1970 when world output exceeded 47 million ounces.

The post-war rise in gold production was almost entirely concentrated in South Africa. From 1947 to 1970 South African annual gold output increased nearly three-fold from 11 million to over 32 million ounces. The large-scale development of new mining sources in South Africa during a time of rising gold production costs and a fixed market price was in large measure due to a plentiful supply of relatively cheap labor. In other parts of the world gold production generally declined.

To understand the impact of the price of gold on mining production and industrial use from 1934 to 1967 one needs to examine not the unchanging dollar price, but the price in real terms, in constant dollars. It is the real price of gold that determines the profits to investors, the return to producers, and the relative profitability of gold for industrial use compared with possible substitutes.

From 1934 through 1967 the market price of gold was pegged at \$35 per ounce in current dollars, apart from a few minor and temporary deviations. But the price of gold in real terms behaved very differently. In 1934 the constant dollar gold price was more than double the 1929 level and far above the index of related metals. In addition to stimulating a long expansion of gold production, the high support gold price reduced the net industrial use of gold almost to zero. From 1934 until 1940 industrial gold purchases in the United States were actually negative, that is new bullion purchases were less than the return from old scrap material.

From the high point in 1934, the real price of gold began a steady decline which was not halted for some 35 years. By early 1970 the price of gold in constant dollars had declined about 75 per cent from 1934.

The decline in the real gold price was reflected in the trend of private demand. During the 1930's and 1940's the cumulative total of government gold purchases, mainly by the United States, to support the

price was nearly equal to total world production. Industrial demand and speculative private investment were negligible factors.

During the 1950's the proportion of gold production acquired by governments was gradually reduced and industrial demand rose steadily until a temporary balance between gold production and private demand was reached by the mid-1960's. The rise in industrial gold purchases during this period was spectacular, increasing nearly three-fold between 1950 and 1965. By the late 1960's industrial demand for gold was close to 40 million ounces a year, approximately equal to total mine production in the non-communist world. As a result, the historic government floor price support for gold that had resulted in a long build-up of official stocks turned into a price ceiling -- a development that was inevitable at some point in time. Gold was no longer profitable to produce but was increasingly attractive for industrial use. The traditional government subsidy to gold producers had become a subsidy to industrial users.

By 1967, a continued rise in the general price level reinforced the general belief that a fixed price for one commodity such as gold could not long be maintained. Speculative buying increased and for the first time in history large government gold sales were required to hold the price at a level considered appropriate for the international exchange standard but which had become totally inconsistent with the economic realities of gold production costs and industrial demand.

1968-1975

March 17, 1968 is perhaps the key date in the relatively brief history of gold as a significant part of the world monetary system. On that day in Washington the monetary officials of seven major industrial powers issued a communique announcing a halt to their efforts to peg the price of gold by purchases and/or sales through the London gold pool. Henceforth, the price of gold for private trading would be free

to seek its own level as determined by supply and demand in the world market. Although official dollar-gold convertibility by the United States continued until August 1971 and some minor de jure details still remain to be cleared up, March 17, 1968 marked the de facto end of the international gold exchange standard and the beginning of the first free private gold market in modern history.

The end of official efforts to peg the market price of gold was in retrospect inevitable. The price of gold like other commodities must ultimately be determined by the interplay between production costs and its market value in terms of economic use. The high government support price of gold, well above production costs until the 1950's, masked this truism and created the illusion that the price of gold was distinct from all other commodities and could be indefinitely determined by monetary authorities entirely according to monetary considerations. In fact, the high official support price for gold required the governments of the world, for over a century, to buy and hold the great bulk of total gold production. During this period the official price of gold in effect constituted a subsidy for producers and a penalty for industrial users.

By the 1950's and more clearly in the 1960's as general prices and production costs continued upward, this situation was gradually reversed and the traditional government support price for gold became a price ceiling. Gold producers were now the recipients of the government penalty and industrial buyers and consumers benefited from the subsidy. A substantial portion of world gold production could be maintained only by government financial assistance. At the same time, the arbitrary price ceiling and the declining price of gold in real terms resulted in a rapid rise in industrial gold purchases from just over 13 million ounces in 1955 to 43 million ounces in 1970.

As would be expected, the growing imbalance between the basic supply and demand for gold at the arbitrary ceiling price put increasing

pressure on sales from government stocks to make up the deficiency. The problem was compounded by a resurgence in world inflation in 1967 and 1968. The strong industrial demand was reinforced by speculative buying, and it became obvious that the official gold price which had been fixed for over thirty years could not long be maintained. The attempt to hold the gold price at \$35 required nearly 100 million ounces of government gold sales through the London pool in the six-month period prior to March 1968.

At this point it became clear that the monetary policy authorities had three choices. First, gold sales through the London pool at the fixed price could be continued indefinitely. This was obviously a losing proposition and ultimately would result in a total depletion of official gold holdings at an increasingly attractive bargain price for no rational purpose. Understandably this alternative had very little popular appeal.

A second possible alternative was to raise the ceiling price to a higher level. But apart from the difficulty of selecting a magic figure that would not require substantial government sales or purchases of gold to maintain, an arbitrary increase in the official gold price designed to keep pace with price changes in other commodities would in itself end the special monetary status of gold. Gold cannot at the same time be a stable measure of value and rise in monetary value itself like an ever-lengthening yardstick. The monetary authorities recognized that a periodically rising official gold price would at best be an index of general price changes and at worst be a major contributor to inflation if gold retained a functional role in the monetary system.

The third alternative, and the one chosen by the monetary authorities, was to end all government purchases and/or sales of gold in the private market at the official price and permit the price in that market to be determined entirely by private supply and demand. It was hoped that the very heavy government gold sales in the previous months would allow a period of relative price stability during which the monetary

authorities of the world could work out a more practical and lasting solution to the gold problem.

The immediate effect of the end of official intervention was to permit gold to be traded in the world market under essentially the same institutional practices and procedures in effect for similar commodities such as silver or platinum. The development of the new gold market will be discussed in more detail later but at this point it is sufficient to note that it had its beginning on March 17, 1968.

Contrary to general expectations, the ending of official intervention in the private market was followed by a three-year period in which the price of gold remained relatively stable. In March and April 1968 the gold price rose rather quickly to the \$40 range and in general varied between \$35 and \$40 until the end of 1971. During this period several major factors which tend to raise or lower the gold price were more or less in balance. The major depressants on the price were the large overhang of speculative holdings acquired in 1967 and early 1968; continued large gold production, and a moderate world recession in 1969 and 1970. These down factors were largely offset by strong industrial gold demand, and a virtual halt to Soviet sales throughout this period.

In 1972 the four-year period of relative price stability in the world gold market came to an end. The basic supply, demand and environmental factors which were conducive to a flat price trend since early 1968 had substantially changed. Gold production which had peaked in 1970, began a long decline, influenced by the prolonged depression in the real gold price as well as depleted below-ground reserves. By 1972 gold production had declined by nearly 15 per cent with even larger reductions in sight for the years ahead. At the same time low gold prices relative to other commodities stimulated continued strength in industrial demand which was now in excess of gold production. And finally, the large overhang of speculative holdings, acquired prior to March 1968 had in large measure been worked off.

About this time most of the world economies entered a period of economic expansion and strong price inflation. The prices of virtually all world-traded commodities rose sharply to unprecedented levels and gold was no exception. The gold price rose to the \$65 range in mid-1972, to \$120 in 1973 and finally topped \$170 in early 1974. But it should be emphasized that while the changing gold price was loosely associated with various monetary influences during this period, its over-all rise was not appreciably out of line with changing prices in related commodities. All commodity prices rose and gold was part of the general picture.

However, the behavior of the gold price through most of 1974 cannot be attributed to either basic supply-demand factors or general commodity price inflation. While the trend of gold production continued downward, the rate of decline was not greater than in earlier years. Moreover, industrial gold consumption, which remained strong through 1972, dropped sharply in 1973 and 1974 due both to high prices and the inventory risks created by wide swings in the price. The electronics industry in particular explored ways to reduce gold use and substitute cheaper metals wherever possible. And finally for most of the world economy 1974 was a time of recession with a shortage of demand rather than supply the major problem.

Despite the general economic slowdown and evidence of weakness in most commodity prices, the price of gold surged to a new high, briefly topping \$190 at the end of 1974. In retrospect it seems evident that the inflated gold price in the latter half of 1974, counter to the trend in other commodity prices, was largely if not entirely due to a single cause, i. e. , a widespread miscalculation over the expected impact of the lifting of restraints on gold ownership in the United States. In anticipation of strong American investor demand, gold bullion inventories were increased and speculative buying accelerated abroad. In January 1975 the expected demand did not materialize and the price of gold dropped sharply. A key factor generally overlooked by participants

in the 1974 speculative surge was the de facto ending of U.S. gold ownership restraints in December 1973 when the purchase of bullion coins was first authorized. In 1974 Americans acquired over 3 million ounces of gold in coin form and this proved to be a fairly accurate measure of the extent of non-industrial gold demand.

In general, 1975 was a year of correctional adjustment in the gold supply-demand situation. The long decline in world gold production continued but at a slower rate. Encouraged by improved economic conditions and lower gold prices, industrial demand showed a substantial increase, particularly after mid-year. However, the price of gold continued to ease and did not react to a temporary surge in other commodity prices in June and July.

The continued gold price weakness in the face of more bullish conditions can be attributed to a remaining overhang of speculative holdings, the U.S. Treasury sale at mid-year, and the anticipation of IMF and possibly other official sales in 1976 and beyond.

Gold Production in the Soviet Union

Under a widely accepted convention of statistical presentation, gold production in the Soviet Union is customarily excluded from or shown separate from production elsewhere. This custom is mainly a matter of expedience. Soviet data on gold production and stocks are not readily available and estimates of net sales in the world market are considered to be somewhat more reliable. The net Soviet sale figure is added to gold production in the rest of the world to arrive at the total market supply. Net gold purchases or sales by other governments may be a component of supply or demand depending on how the plus or minus sign is applied.

Actually there is no sound economic reason for according Soviet gold production and sales special treatment. Gold producers in the Soviet Union are subject to the same capital needs and cost factors as producers elsewhere. The myth that Soviet producers do not need to turn a profit is just that -- a myth. It is simply a matter of definition. Soviet gold output must ultimately be sold in a competitive market. If the resources needed to produce it can more profitably (with greater economic return) be used in other ways they will be.

As far as can be determined the bulk of Soviet gold production over the past 30 years has been sold in the world market. Apart from somewhat greater irregularity, Soviet gold marketing concepts and procedures are not appreciably different from other major producers. All producing entrepreneurs -- government or private, large or small -- have occasional urges to outguess the market by building speculative stocks, invariably with adverse results. Fortunately most private gold producers have a limited capacity to do this, so the potential losses are minor.

Estimates vary but it is generally believed that Soviet gold production

has been rising and is now probably close to 10 million ounces a year. Soviet gold stocks are thought to be in the neighborhood of 100 million ounces. Over the past five years Soviet gold sales are estimated to have averaged close to 6 million ounces a year.

The Soviet Union is on the average, a high-cost gold producer -- largely because of adverse climate conditions. Over the next few years Soviet gold production is expected to show a further rise, with emphasis on investment in more temperate climate areas. Like other producers, they will be assessing trends in supply, demand and price, and their conclusions will have an impact on the future trend of Soviet gold production.

But whether or not Soviet gold output rises it seems reasonable to assume, given the over-all economic situation, that their annual gold sales over the next five years will be similar to those over the last five years, i. e. about 6 million ounces.

The Gold Supply-Demand Outlook

Overview

In 1976 there are clear indications that the adjustment period necessary to correct the gold supply-demand imbalances of 1973-1974 is coming to an end. Industrial gold demand, which had dropped sharply because of high and uncertain prices, recovered strongly in 1975 and is doing even better in 1976. Industrial buying, at over 30 million ounces a year and rising, is now probably in approximate balance with world gold production outside the Soviet Union. With economic recovery accelerating in most of the world, it seems probable that industrial gold demand over the next five years will substantially exceed current gold production.

World gold production outside the Soviet Union has steadily declined from about 41 million ounces in the peak year of 1970 to an estimated 30 million ounces in 1976. The reduction in the market supply in the form of gold bullion bars has been even greater because of the substantial diversion of gold production into coins in recent years. The production of gold coins, which was negligible prior to 1973, now averages from 7 to 9 million ounces a year. Annual non-Soviet gold production available for industrial use is, therefore, probably less than 25 million ounces, well below the most conservative estimates of industrial demand. The prospective supply deficiency at the present price level provides room for a reasonable volume of gold sales from the Soviet Union, the IMF, and other government sources in 1976 and beyond with no resulting decline in the real price over the long run.

Production

World gold production rose steadily after World War II, leveled out in the late 1960's, and since 1970 has shown a substantial decline.

World Gold Production
(Millions of Ounces)

	<u>South Africa</u>	<u>Soviet Union</u>	<u>Other Countries</u>	<u>Total</u>
1950	11.7	3.6	13.0	28.3
1955	14.6	3.5	12.3	30.4
1960	21.4	4.1	12.3	37.8
1965	30.6	5.0	10.6	56.2
1970	32.2	6.5	8.8	47.5
1975	22.8	9.0	7.4	39.2

The reduction in the annual amount of gold bullion bars sold in the world market since 1970 has been even greater than the decline in total production. The difference is due to the much larger volume of gold coins produced in recent years. From 1933 through 1968 gold coin production was negligible. In 1970 not much over a million ounces of gold production was diverted into coins. By 1975 this total had increased to 7 million ounces. It is estimated that the supply of gold bullion bars on the market in 1976 will total about 25 million ounces, exclusive of sales by the Soviet Union and the IMF, compared with estimated industrial demand of 35 million ounces.⁽³⁾ The apparent 10 million-ounce supply deficiency is assumed to be offset by a combination of Soviet and IMF gold sales.

The world gold supply from all sources -- including sales from official stocks -- appears now to be in approximate equilibrium with demand for industrial bars and gold coins. There is very little speculative buying of bar gold. The current situation is, therefore, useful as a base for assessing the short and long run outlook for the supply, demand and price of gold as well as the factors which influence changes in mining production and industrial use.

In common with other minerals, gold in its natural state tends to

⁽³⁾U.S. Treasury Department staff paper.

be concentrated in pockets or "reserves" throughout the world, typically below ground, in varying accessibility and extractable at varying costs. The greater part of these reserves have, in broad terms, been identified and classified according to estimated amounts and production costs. What will be done with them is a matter of basic economics. The key consideration being that below ground gold anywhere will be extracted and processed into a marketable commodity only when and if it can be sold in a competitive market at a price that exceeds production costs, including an adequate return on capital. Capital resources will be directed into new gold production only if the expected range of future prices indicates the investment will be profitable.

On the demand side, gold will be bought by industry only if it can be used in products that can be sold at a profit in a competitive market. Capital resources will be directed into gold using industries only if expected future prices will allow for profitable operations.

There are, of course, other considerations which make the relationships between costs, price and gold production imprecise in the short run. Closing down and reopening a mine can be an expensive process. There is, therefore, a tendency for mineral producers to keep mines operating for a reasonable time during loss periods if there is an expectation that the cost-price ratio will turn favorable. If the cost-price ratio does not improve sufficiently the producers obviously must at some point cease operations. Prior to World War II, California, Colorado, and Alaska were important gold producers. In the 1930's, gold was even profitably mined in the suburbs of Washington, D. C. These operations ceased because they were no longer profitable.

The evaluation of current and prospective production costs and market prices is a continuing process by all gold producing units as well as by the governments directly concerned. Under provisions of the Minerals Policy Act of 1970, the U.S. Bureau of Mines is required to make periodic long-range estimates of the world supply and demand for

a broad range of minerals, including gold, under various supply-price assumptions. In its most recent estimate the Bureau concluded that the mining of about 1.3 billion ounces of below-ground gold reserves is economically feasible at prices up to \$200 an ounce (in 1974 dollars). At higher prices a larger total could be mined profitably. At lower prices the amount of extractable reserves would be less. The geographical distribution of these reserves in millions of ounces is as follows:

Estimated Below-Ground Gold Reserves
(Millions of Ounces)

Republic of South Africa	800
USSR	200
United States	120
Rest of the World	200
	<u>1,320</u> (4)

The total remaining below-ground gold reserves are about matched by the approximately 1.3 billion ounces held in the vaults of governments and international agencies:

Government Gold Stocks, June 1975
(Millions of Ounces)

U. S.	275
IMF	153
West Germany	118
France	101
USSR	100 Est.
Switzerland	83
Italy	82
BIS	6
Other Countries	361
	<u>1,280</u>

(4) U.S. Bureau of Mines: Mineral Industry Yearbook, 1974.

And finally, non-government gold holdings in coin, bullion and other non-fabricated form, are estimated at about 500 million ounces. The estimated breakdown of non-government gold holdings exclusive of fabricated products is about as follows:

Estimated Private Gold Stocks, December 1975
(Millions of Ounces)

Coins	400
Private bullion holdings	75
Industrial inventories	25
	<u>500</u>

Combining the three components, a reasonable estimate of the total of all world gold reserves, below and above ground, is about 3 billion ounces. Collectively, this is the world's total supply of gold and all of it can be presumed to be in process of conversion into final consumption however far into the future the end result may be.

In addition to global estimates of workable gold reserves under various price assumptions, a relevant current market factor is the separate estimates by individual producers and would-be producers that comprise the global figure. Comprehensive data on current gold production costs and private projections of reserves and future costs are not readily obtainable. However, there is enough data available to form general conclusions on the current cost picture and to hazard a few conclusions on future supply-price trends.

Two-thirds of the free world's gold supply is produced in South Africa by privately owned companies operating in the expectation of making a reasonable return on their capital investment. Decisions on whether to expand operations or indeed whether to continue operating at all are based on a continuing assessment of production costs and market prices.

In 1975, 39 operating mines in South Africa produced about 22

million ounces of gold. Working costs at the various mines, according to data from the Chamber of Mines, ranged from \$32 to \$199 per ounce of gold with a weighted average cost of about \$73 per ounce. Adding in capital costs would increase this average figure by about 15 per cent although capital outlays will, of course, vary greatly from mine to mine.

Of more immediate relevancy is the proportion of current production with costs approaching or above the current price. Seventeen mines with about 20 per cent of the total South African output reported working costs in 1975 in excess of \$100 an ounce. Eight mines with about 7 per cent of total output required State financial aid in 1975 despite an average gold price for these mines of about \$137.

In December 1975, the U.S. Bureau of Mines completed a study comparing production costs at three representative gold mines: the Carlin mine, an open-pit operation in Nevada; the Homestake mine, an underground operation in South Dakota producing 300-400,000 ounces a year; and the Kinross mine, a producer of similar size in South Africa. Two methods were used to derive comparable costs: (1) use of company reports on sales of gold and net income, and (2) a financial computer program simulating each operation using production data and estimated capital and operating costs to compute depreciation depletion, taxes and the price required to generate sufficient revenues to obtain 0, 12 and 20 per cent rate of return on the invested capital. The results of the study are shown in the following table.

Summary of the Prices, Incomes, and Costs
of the
Carlin, Homestake, and Kinross Operations⁽¹⁾

Method 1. Use of company annual report data⁽²⁾

	Carlin	Homestake	Kinross
Sales price ⁽³⁾	\$164.93	\$157.85	\$163.46
Less net income	<u>67.96</u>	<u>53.67</u>	<u>56.02</u>
Company cost deductions ⁽⁴⁾	\$ 96.97	\$104.18	\$107.44

Method 2. Computer simulation to compute price to generate sufficient revenues to obtain the indicated DCFROR.

Price @ 0% ROR ⁽⁵⁾	\$ 45.31	\$91.12/90.36 ⁽⁶⁾	\$132.97 ⁽⁷⁾
Price @ 12% ROR	48.64	94.64/94.77	138.57
Price @ 20% ROR	51.60	96.95/97.86	142.77

(1) All values in 1974 U.S. dollars per troy ounce gold.

(2) Source: 1974 company annual reports.

(3) Sales price derived from total revenues of gold sales divided by total ounces of gold sold.

(4) Cost deductions include all operating costs, depreciation depletion, exploration, research, interest expense, taxes, and miscellaneous costs.

(5) These prices are sufficient to generate revenues to pay taxes, return the investment, and return a profit if ROR is greater than 0.

(6) Values preceding the slash were obtained by expensing all estimated capital costs and including these costs as operating costs. This includes mine equipment replacement. Values following the slash were obtained by capitalizing these estimated capital costs.

(7) Computer routine adjusted to delete depletion, investment tax credit, local taxes and to accommodate annual tax value listed in available data.

Source: U.S. Department of the Interior, Bureau of Mines.

Gold production costs have risen substantially in recent years. Much of this increase is due to higher labor costs, particularly of black workers whose wage rates have quadrupled over the past three years. Increases in production costs at the various mines in 1975 varied from 16 to 30 per cent. Comparable increases are expected in 1976.

In addition to higher costs for labor and capital equipment, the substantial reduction in recovery grade in recent years has been an important factor in raising working costs per ounce of gold produced. Since 1970 annual ore production has remained relatively stable at about 75 million tons. But the amount of gold obtained from the ore milled has declined from 989 tons in 1970 to only 708 tons in 1975. In part this was a planned reduction in recovery grades in keeping with normal practice at higher gold prices required by the South African Government.* But the lower recovery rate is also due to a steady depletion in the richer ores at many of the older mines, a trend which will continue in the years ahead.

Cost pressures on the producing mines have been somewhat eased by the recent devaluation of the rand which has improved the gold producer's cost-price ratio. But this is only a temporary palliative. In the longer run devaluation of the local currency tends to increase domestic inflation which will worsen the cost problem for gold producers.

There is no reason to expect that the producer cost situation in other non-Communist countries is materially different from that in South Africa. The annual amount of such production has been declining for years and now totals only about 7 million ounces. Gold production

* Much is made of this point in analyses of gold production trends. But since the nominal gold price only changed once in two centuries prior to 1968, the practice is certainly not deeply rooted in tradition.

in the United States is down to about a million ounces a year, nearly half of which is a by-product of other metals. Most of the remainder is from relatively high-cost deep mines. Homestake mine, the largest American gold producer, reports production costs per ounce as very close to the current market price and rising steadily. In Canada the picture is much the same. Most of the Canadian gold output is from deep mines and working costs per ounce are estimated to be predominately in the \$120-130 range.

Among the world gold producers, only the Soviet Union has increased output in this decade. Although no precise figures are available, current Soviet gold production is considered to be increasing and may now be in the area of 10 million ounces a year. A large proportion of Soviet output is placer gold mined from surface deposits. Ordinarily this tends to be relatively low-cost production but the difficult terrain and weather conditions under which the gold is produced probably make working costs at best comparable to western mines. As elsewhere, human and capital resources in the Soviet Union are limited and gold production is not likely to expand unless the cost-price ratio is favorable compared to other investment alternatives.

While there are ambiguities in gold production cost data and comparisons between geographical areas cannot be precise, one general conclusion seems clearly evident. The cost of producing gold everywhere has risen sharply in recent years, is now pressing against the market price, and is certain to continue rising over the foreseeable future. Setting aside for the moment the disposition of above-ground stocks, this trend must ultimately force increases in the market price unless offset by one of two possible offsetting factors, both extremely unlikely. The first would be a major adverse shift in the industrial demand curve for gold. The second would be the discovery of a massive new underground gold reserve. There are no present indications that either of these possibilities will occur.

In a competitive market, a rational gold producer, whether in South Africa, South Dakota, or Siberia, will mine gold in as much quantity as possible as long as the market price exceeds marginal production costs. If production costs and/or market price turn adverse, the more costly operations will be curtailed until the mine is once again profitable at the margin. If no combination of ore grade and production volume covers working and capital costs the mine will close down.

If producers had instant availability of correct data and perfect flexibility in resource use, responses to cost-price changes would be immediate. In practice of course such perfection is never achieved. Shifts in production in response to imperfect data can be costly. The expense of closing down and re-opening a mine is substantial. There is therefore, a tendency to maintain production under adverse conditions in the hope that the situation will improve. Also governments are prone to subsidize deficit operations for reasons more political than economic, more fanciful than real.

These factors tend to slow the response of gold producers to changing market conditions, but they do not negate the ultimate effect of market reality. Production costs and market prices for any commodity cannot be out of line for very long. Assuming a normal demand curve, an across-the-board rise in production costs will ultimately be reflected in a higher market price, temporary declines notwithstanding.

In various assessments of the current state of the gold market and future price movements great emphasis is frequently given to the changing attitudes of so-called "speculators and investors" -- a supposedly volatile group whose changing mood can move the gold price sharply in either direction. But an objective analysis of the historical record indicates that this belief is simply one of many modern economic myths. Over the past two centuries speculation in gold has been a significant factor in the market in only two brief periods -- a few months prior to

March 1968 and again in the latter half of 1974. At all other times speculation in gold has been of little consequence.

It is true that historically the price of gold has had little opportunity to seek its own rational economic level. For over a century prior to the early 1960s, government intervention fixed the gold price at an arbitrary point far above the private supply-demand level. During this period speculation was by definition, non-existent. In the late 1960s the government gold price support gradually became a price ceiling made to order for speculation. By mid-1967 private speculators became convinced that the price ceiling could not long be maintained and placed their bets accordingly. But this was a short-lived unique situation not likely to occur again. The milder speculative wave in late 1974 was also a popular reaction to a unique situation. At all other times speculative buying or selling of gold has been a minor factor of less consequence than similar activity in most other commodity markets.

But if short-run speculative dealing has not been of great consequence in the gold market, what about investment in gold by individuals motivated by longer run considerations. Here too there is no evidence that gold buying as an investment is more than a marginal factor in the gold market or that it moves very much in response to changing circumstances. The net acquisition of gold by individuals and other non-industrial private buyers -- including coins -- since the end of World War II has probably averaged no more than 4 million ounces a year, less than 15 per cent of total demand. Most of the residual private hoard has been accumulated over a long period of time, is widely diffused among a great many relatively small holdings, and does not constitute a volatile "over hang" in the market.

It seems apparent that any plausible projection of the supply-demand-price relationship for gold must place the primary emphasis on two factors: (1) the flow into the market from production and government stocks, and (2) basic industrial demand.

Industrial Demand

The industrial demand for gold is usually classified in three categories: (1) jewelry in a variety of forms, (2) dental products, and (3) other industrial use, primarily electronics but including substantial amounts for insulation and decorative use. Industrial buying is the mainstay of the gold market averaging over 85 per cent of total private demand since 1970. Any judgment of future demand for gold must, therefore, be based primarily on the composition of industrial demand and its response to price developments.

World industrial demand for gold rose steadily from the end of World War II until the early 1970's. Stimulated by a declining real price and an expanding range of new technical uses, industrial gold-buying more than tripled from 1950 to 1970. In the years 1970 through 1972 industrial gold demand was substantially in excess of total mine production in the non-Communist world. The gold price surge and unsettled market conditions in 1973 and 1974, together with a general slow-down in the world economy, resulted in a sharp cut-back in industrial gold demand. The drop in industrial gold-buying was magnified by a concurrent reduction in industrial gold inventories.

In 1975 with lower gold prices, more stable market conditions, and an improved world economy, industrial gold demand recovered sharply. The rise in industrial buying has continued into 1976. A recent Treasury staff study cited elsewhere estimates industrial gold demand in 1976 at 35 million ounces -- a figure very close to current world gold production including the Soviet Union. If allowance is made for a diversion of 5 to 7 million ounces of annual gold production into coins, the supply of gold from current production is now insufficient to satisfy market demand at the present price level in the absence of supplementary net sales from government stocks.

A further comment at this point on the demand for gold coins

might be helpful in defining the current market. Public buying of gold coins ranges from very limited issues of artistic merit at a price substantially above the value of the gold content to the so-called bullion coins available in whatever quantity the market demands at only a slight premium over the gold content value. The first category is generally conceded to be a form of gold consumption not very different in concept from gold jewelry. The latter category is usually considered as a form of gold speculation or investment, akin to a purchase of bullion. Indeed, for anyone wishing to hold physical gold for whatever purpose, bullion coins are probably as good a way to do this as any other.

However, a conclusion that the total of bullion coin purchases should be included in the "gold speculation and investment" category is at least open to question. Resales of these coins are infrequent so they tend to be firmly held by the original buyers. Among certain classes, gold coins are included in the portfolio of assets as a form of disaster insurance with no expectation at all of speculative or investment gain. If the political or economic disaster never occurs, the cost of holding the coins can be written off as a form of term insurance. In certain parts of the world the purchase and holding of gold coins can be a useful aid to avoiding income or inheritance taxes and the gain or loss in holding the gold is a secondary consideration. The cost alternative would be to hire a good tax lawyer.

The main point is that gold coins are to some extent bought and held for reasons only dimly related to speculation or investment. A reasonably solid market for bullion coins has developed in recent years partly as a replacement for individual bullion-buying in earlier years and partly as an add-on to total private demand. To a considerable extent this buying will be maintained.

But the dominant factor in the gold market in the future, as it has been in the past, will be industrial demand.

The price elasticity of industrial demand for gold has until very recently received little attention in analyses of the supply, demand, and price outlook for gold. Attention has centered on such marginal factors as monetary disagreements, exchange rate shifts, inflationary expectations, and political instability in this or that country. These considerations, if they influence the price of gold at all, affect at most 10 to 15 per cent of total market demand. The central issue that directly concerns the buyers of 80 to 90 per cent of gold production has been largely ignored. It is this: Can gold at a given price be converted into a product that can be sold in a competitive market at a fair profit?

Gold in all its commercial uses is a substitutable commodity; that is, there are alternative materials that can be used if not precisely as well as gold, then nearly as well. Logic tells us that at higher prices consumer resistance will set in for gold-fabricated products which will be transmitted through industrial fabricators to the world bullion market. At lower prices rising consumer demand will affect the bullion market in the opposite direction. The reference here is to prices in constant dollar terms since inflation (or deflation) simultaneously changes the whole economic context, incomes, production costs and the prices of substitute materials.

Two recent economic analyses have been directed to the question of whether and to what extent the industrial demand for gold is influenced by changes in the market price: one by the research staff of the United States Treasury Department and another by Peter Fells and Christopher Glynn of Consolidated Gold Fields Ltd. Both analyses reach essentially the same conclusion, that industrial demand for gold is highly responsive to changes in price, rising when the real price declines, and vice versa.

The Treasury study, cited earlier, concludes that the industrial demand for gold is responsive both to changes in price and income. World industrial price elasticity for gold is estimated to be between

-.5 and -1.0 with -.7 a reasonable figure for working use. Income elasticity is estimated to be within .8 and 1.5 with 1.0 a figure not inconsistent with the study results. In broad terms the implications of these figures are that at a constant real price, industrial use of gold will increase at approximately the same rate as real GNP. At lower real prices industrial gold use will rise more rapidly than GNP. At higher real prices industrial use will rise more slowly or even at some point decline.

The Fells-Glynn conclusion is similar in substance, estimating that for every fall of \$1 in the gold price (in 1975 dollars) annual purchases for jewelry fabrication will rise by 6 tons. The implicit price elasticity figure would be in the upper range of the Farrell study. The implications of their conclusions, according to Fells and Glynn, are that at the current gold price level (\$120 to 130) jewelry fabrication absorbs about 50 per cent of present gold production, with other industrial demand and coins absorbing the remainder. At lower prices non-speculative demand would exceed production; at higher prices, production would exceed industrial demand. It may again be noted that the reference here is to prices in constant dollars which lag the nominal gold price by the world rate of inflation.

The conclusions that can be drawn from these studies regarding future trends in the supply, demand and price of gold are of some interest and importance.

The most important general conclusion is that there will be an excess of industrial demand over current production in future years, if the price of gold remains stable in constant dollars. Moreover, because of the income elasticity factors, the shortage of production relative to industrial demand would steadily increase. Expressed another way there will be an increasing need for gold sales or leasing of gold from government stocks in future years within the context of the present gold price range (\$120-130) in constant 1976 dollars. If

there is a curtailment of sales from government stocks, or if they are held at the present level (about 10 million ounces a year, including Soviet sales) the price of gold must rise relative to other commodities in order to bring current supply and demand into balance; i. e. , to induce producers to maintain output and/or force consumers to cut back buying.

The qualitative substance of this conclusion is more important than trying to quantify it in precise amounts. However, the elasticity studies now available give a good clue as to the future amounts of government gold sales that would be consistent with a fair market value to both producers and consumers, and would not arbitrarily disrupt the normal market process as government actions have done in the historical past.

A reasonable projection of the Farrell and Wells-Glynn findings in the context of the future supply outlook would allow for an annual increment of one to three million ounces of government gold sales over the next decade to meet expected industrial needs at a relatively stable price in constant dollars. By 1985, this would mean annual gold sales from government stocks would be in the range of 25 to 30 million ounces at a current dollar price roughly double the present level.

The key consideration here deserves repeating for emphasis. The dynamics of gold production, industrial demand, and price over the next decade will require either an increase in the real price or a rising increment of supply from above-ground stocks -- government or private. There is no strong possibility that private gold holdings will contribute significantly to the future industrial need nor are such stocks -- which are mostly in coin -- available in sufficient quantity in any event. Government gold stocks no longer have a formal monetary function and will gradually be made available for industrial use, in quantities sufficiently marginal to allow the market price to be predominantly determined by the interaction of private supply and demand. Sales from government stocks in reasonable amounts are not inconsistent with this objective.

SUPPLY AND DISTRIBUTION OF GOLD BULLION, 1950-1975
(Annual Averages in Millions of Ounces)

	<u>1950-54</u>	<u>1955-59</u>	<u>1960-64</u>	<u>1965-69</u>	<u>1970-74</u>	<u>1975</u>	<u>1975-79</u>
<u>Supply</u>							
Mine production	24.4	29.1	36.8	40.4	37.1	30.5	29.0
Net Soviet sales	.9	5.8	9.7	1.6	4.9	4.8	6.0
Other gov't. sales	<u>-11.0</u>	<u>-18.7</u>	<u>-15.9</u>	<u>11.4</u>	<u>- 1.8</u>	<u>.7</u>	<u>11.0</u>
Total	14.3	16.2	30.6	53.4	40.2	36.0	46.0

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<u>Distribution</u>							
Industrial use	12.7	17.3	30.0	37.3	33.3	24.4	36.0
Coinage	*	*	*	.6	3.2	7.1	8.0
Apparent investment	<u>1.6</u>	<u>- 1.1</u>	<u>.6</u>	<u>15.5</u>	<u>3.7</u>	<u>4.5</u>	<u>2.0</u>
Total	14.3	16.2	30.6	53.4	40.2	36.0	46.0

Source: U.S. Bureau of Mines, Consolidated Gold Fields, International Monetary Fund.

* Precious Metals Research Dept., J. Aron & Co., Inc.

The Gold Market

A free marketplace for goods, or labor or securities or commodities is simply a communications facility where potential buyers and sellers -- directly or indirectly, in confrontation or through middlemen -- are able to negotiate a mutually acceptable price based on perceived self-interest. In all such markets a set of practical procedures and customs have evolved to facilitate the transaction and pricing needs of the participants. The general objective of these procedures is to maximize transaction volume and enable the range of prices to accurately reflect the collective judgment of the market participants.

The gold market, in its essentials, is virtually identical to those of other world-traded, non-perishable, commodities such as silver, platinum, or copper. These commodities are fungible, that is the accepted trading unit is specifically defined as to amount and quality, each one identical to all others. No physical inspection is required for a transaction to take place. Technically advanced communications facilities have removed geographical limitations to the market for fungible commodities. Trading and pricing can occur, therefore, continuously world-wide in a variety of currencies, at a common price wherever artificial barriers are not imposed at political boundaries. Although a transaction can occur between any two points where there are telephone or telex facilities, major trading centers have evolved where there is a concentration of buyers and sellers, an absence of political restraints, and an historical tradition of commodity trading. Such trading centers are closely linked by modern communication facilities and as a practical matter can collectively be considered a single world market.

The active participants in the world gold market, in common with those of related commodities, can be grouped in four major categories:

producers, traders, speculators, and industrial consumers.

The Producers

Gold is produced for a single purpose: to be sold at the highest available price in excess of production costs. For centuries prior to March 1968, when a free gold market began, producers faced no problem in differentiating between buyers, in seeking out the highest available price. The world gold price was pegged at a fixed level with governments the unlimited buyer and seller of last resort. The only concern of producers was that the official price be high enough to permit an operating profit. Their economic interest was focused almost entirely on government gold policy and only marginally on industrial demand. Governments were both the buyers of the bulk of gold production and the major sellers of gold for industrial use except where marginal advantages of location or transport cost permitted sales directly from producer to user at the prevailing fixed price.

On March 17, 1968, the governments of the major industrial nations by agreement halted all gold dealings with the private market, either as buyer or seller. This sudden action created momentary confusion among the gold producers who had always considered governments, if not the only buyer, the only one to which they had ever given much thought. Attention quickly turned to resolving the questions of who else buys gold and how is it sold.

The sales problem of the gold producers in the United States was quickly resolved. Since 1933 the private gold market had been closed to international transactions. Gold was produced and refined for sale either to the United States Treasury Department or to licensed industrial users. Industrial users had the alternative of purchasing bar gold from the Treasury or from a licensed refiner. Since the Treasury was the residual buyer or seller, one price prevailed for all. The use of gold

by American industry had risen rapidly in the 1960's and by 1967 exceeded six million ounces, more than four times domestic gold production. The large supply deficit was met entirely by sales from the U.S. government gold stock.

The sudden halt to government gold sales in March 1968, sent the major industrial buyers on a hasty search for new sources of supply. Unfamiliar with foreign markets, they turned to domestic producers and negotiated supply contracts, typically based on a premium over the London price. With world market prices relatively stable, this pattern of marketing American gold production continued for several years.

Following the halt to government gold purchases and sales, the Treasury quickly took three administrative actions intended to restore viability to the United States market. First, American producers were permitted to sell their gold anywhere in the world at the best available price. Since the U.S. price was typically at a premium, very little gold was exported under this provision. Second, industrial users were permitted to acquire gold in any world market at the lowest available price, up to the limits of the amounts they were licensed to hold. Third, private traders were licensed to acquire gold in any market for resale to American industrial users. This authorization was eventually broadened to permit American branch firms abroad to deal in gold with foreign nationals in order to maintain a competitive position in these markets. Prior to this time private bullion dealing was permitted only as an adjunct to refinery operations.

The sudden impact of the two-tier market on South African gold producers was even more traumatic. Since the nineteenth century South African production had been marketed in London either directly to the Bank of England or through the London dealers under the general supervision of the Bank. For reasons which are now obscure, the Bank of England closed the London market to gold dealing for a critical two-week period immediately after the two-tier market opened on March 18, 1968.

The Swiss banks quickly moved into the breach and the three largest (Swiss Bank Corporation, Swiss Credit Bank, and Union Bank of Switzerland) formed a pool to purchase and market all South African gold production at prices to be regularly negotiated.

The undertaking between the South African Reserve Bank and the Swiss pool concerned the initial transfer of title to the gold. The physical delivery of South African gold continued to be made to London. In 1972, the South Africans agreed to restore a portion of their gold sales to the London dealers. At present, South African gold sales are divided between the Swiss pool banks and the London dealers. There are no public figures on the proportion going to each, and opinions differ. However a 50/50 split is probably not far from the mark.

The Soviet Union is the other major world source of gold. Although their sales are sporadic, the total amount is substantial. Soviet gold sales are usually made in the Zurich market initially through the local Soviet bank. Their basic objective is the same as other producers, to obtain the highest average price. However, the Soviets are more prone to manipulate sales patterns to achieve this objective. Depending with foreign exchange needs, they tend to hold gold off the market when they think a better price can be realized at another time. This form of short-run speculation is usually a losing proposition compared with converting output into cash as expeditiously as possible.

Speculation in the gold market has not been confined to the Soviets. Producers in other countries have on a smaller scale occasionally gambled by temporarily building up stocks. Industrial users also from time to time indulge in this practice although there is considerable self-deception involved. Indeed, the largest American industrial gold consumer tries to outguess the market as a matter of policy in the conviction (doubtful) that it is better informed than the average buyer. All speculators, of course, share this conviction.

One important point should be clearly understood. No gold producer is irrevocably tied to any marketing locale or procedure. All current arrangements are temporary and subject to change should more profitable alternatives emerge. Every producer is constantly re-assessing the market with this in mind.

No drastic changes in the marketing of gold production are likely in the immediate future. The South Africans have had considerable success in building a market for bullion coins. While kruggerand sales are down somewhat from the 1975 high, demand seems to be holding at a substantial level and is likely to rise gradually over the longer run. The offtake of gold in the form of coin has eased the problem of bullion sales through essentially a separate market.

The great bulk of world gold production is sold directly into the dealer market, primarily through Zurich and London. Direct marketing arrangements between gold producers and industrial consumers are rare, except to a modest extent in the United States, and it is not likely that such arrangements will expand in the future. The producer price procedure which is used in marketing copper, platinum, palladium and other metals is practical only when a few large industrial consumers dominate the market. The industrial market for gold is too diversified for such arrangements to work. And the constant possibility of sales from above-ground stocks would make a producer price agreement on gold precarious in any event.

The Traders

Traders, or dealers (the terms are interchangeable) play an indispensable role in any large market with a multiplicity of widely dispersed buyers and sellers. The trader's function, whatever the commodity -- gold, copper, oil, coffee, securities -- is to bridge the gap between buyers and sellers who would otherwise find it difficult or impossible to come together. The dealer in a real sense makes the market.

The trader acts as a point of convergence for buyers and sellers both in space and time. A holder in Frankfurt may wish to sell spot gold for marks at the same time as a buyer in Chicago wants to contract in dollars for six-months' delivery. By acting as principal in both transactions, the professional gold trader links the two into a single world market.

Although the dealer acts as a principal not a broker in all transactions with buyers or sellers, his objective is to keep his open position at a minimum by balancing buy and sell commitments with others as closely as possible. The trader is not a speculator, nor is he normally a net supply or demand factor in the market. Like the second-hand clothes dealer, the gold trader's profit comes not from price changes but from his buy-sell spread and transactions volume.

In theory, anyone can become a trader in gold or any other commodity simply by hanging out a shingle and quoting a buy and sell price. In practice, however, the sharp competition, and the experience, skills, and required capital, limit the profits needed for survival to a relatively few agile participants. When the two-tier market began in 1968, the Treasury issued licenses to nearly fifty would-be gold dealers, only four or five of which are still active. In the entire world, the gold traders of any real consequence number less than twenty, all of whom are in constant contact to deal with each other and buyers and sellers throughout the world. In total, this group constitutes the world gold market and virtually all gold transactions are effected through one or another of these dealers.

There is one key factor in the gold market which makes it distinct from the markets for other commodities -- with the possible exception of silver. The market factor unique to gold is the enormous quantity from past production held by a diversity of government and private speculators and hoarders throughout the world, an amount estimated to be in excess of 1-1/2 billion ounces, most of it in government stocks.

The holders of this vast stock of gold neither receive nor expect any current return on their investment. The incentives for continuing to hold this hoard are fear of other investment alternatives, the hope of a future speculative profit, or pure lethargy.

The existence of this large above-ground widely held stock of gold affects the dealer market in two principal ways. One obvious effect is that it creates a need for a dealer service to match those who want to hold less gold with those who want to hold more gold for whatever reason. When the negative attitudes outweigh the positive ones, the price eases to a level at which they are again in balance and vice versa. This service is roughly analogous to that performed by an art or antiques dealer or even a dealer in used cars.

Although this is the popular notion of a gold dealer's principal function it is doubtful if the volume of voluntary transfers between private gold holders of differing views is sufficiently large to generate more than a modest return to a relative few except during periods of volatile price change. While the mechanics of this traditional dealer function may make it appear that he is "trading for his own account," such trades simply reflect simultaneous changes of opinion on gold in the external market. When these changes in view are numerous and substantial the price moves and the dealer's volume rises. When there are few differences in the public's attitude toward gold the dealer's business declines. But whatever the situation the dealer's own opinion on gold is irrelevant to the volume of his trading.

In addition to trading among holders of bullion, there is another more subtle way in which the above-ground stock of gold affects dealer activity in the world market. Conceptually, there are really two separate stocks of gold moving in different orbits. One is the vast stock held in unchanging bullion form without expectation of current income by individuals and governments. A second, no less real above-ground stock, is the substantial quantity in industrial and commercial hands which is

constantly changed in form to generate an income return. The industrial stock changes from bullion, through semi-processed stages into fabricated products much of which eventually re-enters the cycle as recovered scrap material. Since gold is almost indestructible very little of it actually disappears, no matter what form in which it is held. Historically there has been very little net transfer of gold between the sterile stocks of governments and other hoarders on the one hand and the income-generating stocks of commercial holders on the other. The present challenge to the gold dealer market is to devise innovative procedures by which such transfers can be made attractive and feasible given the perceived self-interest of both groups.

In persuading the gold-hoarders -- both government and private -- to temporarily part with their treasure, there are two basic problems to be overcome. First, they collectively desire to hold title to a fixed amount of gold at a given price, for whatever reasons. And second, the owners require assurance that their gold assets be reasonably secure against physical loss. Consequently, any practical techniques for moving gold from sterile hoards into industrial processing channels must, all other things equal, neither change the amount of gold in which there is a private equity interest or significantly increase the risk of its physical loss.

In basic concept, the gold investor to participate in a gold-leasing arrangement must be willing to accede to a physical movement of part of his stock from a bank vault to an industrial production line in return for a payment or fee. It would not be feasible for most holders to directly negotiate such an arrangement, but there is a practical way in which the transfer can be made based on the recent development of a large and viable futures market in gold. The procedure would operate as follows:

Assume that gold investor A desires to reduce his stock while investor B wishes to increase his holding. The transfer obviously could

be made through two concurrent spot transactions in the dealer market. But assume further that investor B is willing to take delivery of his added gold say six months in the future with his payment to be made at that time. In this instance the gold dealer, who has concluded separate transactions with both A and B, will have borrowed an amount of gold from the private investment stock which he is obligated to deliver back at some future date.

The dealer can simply store the gold in the interim with the price for future delivery covering his financing costs. Or, as an alternative, he might elect to lend or lease the gold to someone, presumably an industrial user, who can generate profit from its use. The dealer would then receive in return a fee adequate to cover whatever additional risk may be involved due to possible borrower default.

Since there are a great number of spot and future market transactions in gold occurring continuously, any given gold lease arrangement can be rolled over indefinitely with only the fee changing at the end of the agreement period. The total amount of gold available for lease depends on the attitude of gold investors expressed either in direct negotiation or in trading volume on the various futures exchanges.

With regard to satisfying the security needs of the holders of gold for investment, it should be recognized that no gold depository -- be it bank vault or backyard burial -- is without some degree of risk that the gold will not be readily available, or indeed not available at all. Many holders of gold for investment have only a certificate from a reputable bank that the gold is in fact there. If they have confidence in the bank, they believe the quantity of gold specified will be available to them under the terms of the certificate. And for that the gold investor asks for no payment, indeed is willing to pay the bank a small fee for holding gold which he has never seen. It would seem that the risk in lending gold to a large established industrial corporation is no greater than the risk in lending gold to a large established commercial bank.

The difference is that the corporation is able and willing to pay a fee for holding the gold while the bank is not.

The fee charged by the trader for leasing his gold should be sufficient to cover (1) his out-of-pocket costs, i. e. , the extent to which the difference between the spot and futures prices is less than his interest cost; (2) the risk that the borrower will default on his obligation, the charge for which will vary according to the credit rating of the borrower of gold to the same extent that money-lending charges vary; and (3) the trader's profit. The key consideration in this procedure is that the total annual leasing fee be less than the cash borrowing rate which would be the minimum cost of financing any company's gold inventory.

The potential amount of gold under industrial lease, while substantial, is not large relative to total industrial purchases. The overall limitation is the total volume of industrial gold in inventory which is probably not over 25 million ounces world-wide. Obviously the amount of leased gold would not reach this figure but it is possible that the amount could exceed five million ounces within the next few years and increase gradually thereafter.

There are two main limiting factors to the growth of industrial gold leasing: (1) the capacity of the futures markets to handle the required volume of hedging, and (2) the possible immediate tax liability if the company is on a LIFO inventory basis -- as most American industrial users are. The latter problem will diminish if the price of gold holds fairly stable for an extended period of time.

To effectively carry out these arrangements the gold trader must have a substantial source of capital and ready access to a supply of credit at low cost. The successful arbitrageur must operate in volume on very small margins in which minute differences in interest costs are critical to maintaining a competitive advantage. Consequently, all of the major traders are either banks, owned by banks, or have close

working arrangements with banks.

But apart from financial considerations, the key attributes of a competitive gold trader are flexibility and an innovative nature. The competitive gold market is new and in many ways different from the markets for other commodities. New trading practices are appearing and the institutional structure of the market is being created by those who are participating in the day-to-day actions.

Private trading in gold in the modern sense began with the formation of the London market in September, 1919. Prior to the First World War the price of gold was fixed in terms of open convertibility into the major currencies. The producers and buyers sold to or bought from the central banks at an unchanging price so there was no purpose to a private market for gold trading. The suspension of convertibility by the British Government opened the way for a gold trading market in London with international participation and South African production as the major source of supply. The resumption of gold purchases and sales at fixed prices by the Bank of England in 1925 put a damper on gold trading in the London market. In 1931 the British Government ended convertibility and the London market resumed active operations until the outbreak of World War II. The London gold market re-opened on a limited basis in 1954 and from 1960 to 1968 functioned as the conduit through which the major Western powers attempted to control the gold price within narrow limits. Since 1968 the London dealers have operated as a major part of the free world market for gold.

A unique feature of the London market is the so-called gold "fixing" twice daily at 10:30 and 15:00 hours G. M. T. , when for a period of perhaps ten minutes or less the five member firms in effect deal as a unit with the rest of the world at a single price which reflects a balance in gold supply and demand at that point in time. At all other times when the market is open the London firms deal in gold independently and competitively, with separate buy-sell prices just as do dealers in other market centers.

The fixing procedure itself is fairly simple in concept. Representatives of the five London firms gather in a room in open telephone contact with their respective trading offices. The Rothschild representative, who is chairman, begins the proceedings by naming an opening price which he considers in line with gold trades which may have occurred just prior to the fixing period. Each of the five representatives immediately checks with his firm to ascertain the net of buy and sell offers at that price. Before the fixing each firm will have received tentative offers from other dealers or clients throughout the world to buy or sell gold at various specified prices or perhaps at the "fixing price" itself. These offers are added up, together with any new ones in response to the opening fixing price (already on the Reuters wire) and a net buy or sell balance for each member firm is communicated back to the fixing room. The chairman adds up the net sales and/or buy positions of the members and if they total zero, that price becomes the final fixing, the session is over, and the transactions are completed. However, if there is an excess of buy or sell balances, the chairman names a higher or lower tentative price and the procedure is repeated until a balance is reached between the buy-sell positions of the five firms. Only offers to buy or sell at the final fixing price are consummated. The profit to the dealers is a 1/4 per cent fee on gold sales. Purchases are made at the fixing price without additional charge.

Although the procedure is not used in other trading centers the London "fixing" is a useful institution in the world gold market. Although participation is limited to large buyers and sellers, mostly other professional dealers, the contact is world-wide and the negotiated gold price represents a true balance between world supply and demand at the time of the fixing. The London fixing price is, in effect, established through an auction in which all traders throughout the world directly participate.

Zurich is another important gold trading center, primarily for two reasons. First it is a sales conduit for a large share of South African

and Soviet gold production. And second, the large private accounts at the Swiss banks have traditionally shown an interest in gold as an investment and are a convenient local source of funds.

While Zurich is and will continue to be an important trading center for gold, it has one key drawback in that the major dealers are commercial banks rather than trading firms as in London and New York. Although the Swiss banks are as competent as any in dealing with gold, commodity trading is not a normal banking function. Like other commodities gold is now subject to substantial price variation and very few of the larger banks anywhere have shown much interest in gold dealing given its present commodity status. Unlike London and New York, Zurich is not a trading center for commodities in general, so trading in gold and silver alone makes it a rather specialized commodity market.

The Swiss banks will undoubtedly continue a gold dealing function but are not likely to move aggressively to expand operations. As the years pass and traditions fade it is likely that the Zurich gold market will diminish in importance relative to other trading centers.

A number of gold trading centers operate on a regional basis elsewhere in the world. Beirut has been the traditional center for distributing gold throughout the Middle East. The political turmoil of the past year or two has shifted much if not all of this trade to other centers -- notably Damascus and Kuwait.

Hong Kong and Singapore have long been the major centers for gold trading in the Far East.

The recent easing of government restrictions has increased the potential for expanded gold trading in Tokyo and Manila.

The United States as a gold trading center is the newest and probably fastest growing addition to the world market. Active American gold dealers include Mocatta Metals Corporation, Philipp Bros. (a sub-

sidiary of Englehard), J. Aron & Co. , and two commercial banks, Republic National Bank in New York and Rhode Island Hospital Trust Co. in Providence. These dealers operate world-wide and are an integral and important part of the world gold market. In addition, practically all of the major European gold dealers have established active branch operations in the United States.

The United States with principal operations in New York and Chicago is likely to become the largest of the world gold trading centers as it is for most of the other basic commodities. There are a number of factors at work which make this development highly probable. First, the United States is a completely free investment market with no Government restraints on the flow of currency, capital or commodities across its borders. This is a primary requisite for any country becoming a focal point for world financial activity.

Second, communications and other facilities in the United States for dealing in securities and commodities are unmatched anywhere in the world. New York is by far the largest capital market in the world as well as the principal center for trading in most of the basic commodities, including silver. Gold would seem a natural addition to this list.

Third, the United States has for years been the largest industrial market for gold in the world. The purchase of gold by American industry has over the past decade been the strongest sustained factor in the demand for gold, absorbing between 15 and 20 per cent of the total world supply of bullion.

Fourth, the United States has become the largest single source of speculative and investment demand for gold in the world. This may seem surprising in view of the American cool reaction to the lifting of Government restraints on gold at the end of 1974. But the supposed lack of public interest in gold buying and speculation is only relative to the inflated expectations and forecasts by dealers before the event. Although minor compared with other types of investment, the increment to gold

holding by Americans in 1975 in the form of coins and privately held stocks is estimated at over 2 million ounces,* an amount substantially in excess of the increase in private holdings in any other country. Including net purchases for industrial use the total American demand for gold in 1975 approached 6 1/2 million ounces. In 1976 this total may well exceed 8 million ounces, a substantial share of world gold demand.

Fifth, the great bulk of all the above-ground gold stocks of the world are concentrated in the United States. Including holdings by the Federal Reserve Bank of New York on behalf of foreign governments and international financial institutions, over 650 million ounces of gold are physically stored in the United States, most of it in New York City. Market sales from these gold stocks have been trending upward in recent years and will probably exceed 8 million ounces by 1976 including various swap and lease arrangements. Adding on mining production and recovery from old scrap it seems likely that the supply input from new sources in the Western Hemisphere into the world gold market in 1976 will approximate 15 million ounces and grow fairly steadily in subsequent years. The expansion of the gold supply here in contrast to a contraction or a flat trend elsewhere will give impetus to the development of the United States as a trading center.

Sixth, the continuing development of trading in gold futures contracts on the organized commodity exchanges in the United States and gives an added dimension to the American gold market and the expansion of New York and Chicago as trading centers. Although trading in gold futures is still relatively small in volume compared with silver, the total volume of transactions approached 100 million ounces in 1975 and is likely to increase in future years. The availability of a large and viable futures market enables dealers to hedge their holdings and permits

* Estimate by Constantine Michalopoulos in Gold 1976, published by Consolidated Gold Fields Ltd.

greater flexibility and innovation in trading practices.

Seventh, the United States offers an environment of greater political and economic stability than any other world market. This is the fundamental requirement of world investors in commodities as well as securities and has in the past been the basic strength of gold markets in Great Britain and Switzerland.

Taken together the seven factors outlined above would seem to give the United States a clear edge over other centers in expanding trading in all commodities -- including gold.

The Speculators

All participants in commodity markets -- gold or any other -- are, in some circumstances, speculators. A decision to commit resources to produce gold, or silver, or copper or any other marketable commodity implies some risk that the funds committed will be lost in whole or in part. An industrial buyer hopes to convert the commodity into more profitable form but is never sure that this can be done. The dealer, who purports to profit only from his service in bringing together other buyers and sellers, cannot avoid exposed positions from time to time. But apart from unavoidable exposure to market price changes incidental to their main economic actions all of these market principals -- producers, dealers, industrial consumers -- will, on occasion, deliberately increase or decrease their holdings solely on expectations of price change. In short they are all, if only on a part-time basis, speculators.

The popular stereotype of a gold speculator, however, is one who buys and sells bar gold on a short-term basis in the expectation of transaction profits.

The notion that such dealing is a major factor in the market appears to be largely a myth. Except for a few brief periods such as in late 1967 and 1974, there is no hard evidence that speculative trading in spot gold

is a strong factor in the market. Even in periods of currency turmoil, there is no great inducement to speculate in gold. It is more interesting and potentially lucrative to speculate in one currency against another for those who are so inclined.

However, there is one potential arena in which short-term speculation in gold may well expand over the foreseeable future. And that is in gold futures trading on the large American commodity exchanges. In January 1975 gold was included in the list of commodity futures traded on the major exchanges in New York and Chicago. While the volume of gold futures trading in the first year was somewhat below expectations, and is still much less than the interest in silver futures, there is some hope among dealers and brokers of considerable growth over the next few years.

The spectrum of gold futures trading is similar to that of other metals with most of the public participation based on purely speculative motives. Hedging transactions by either producers or fabricators have been only a minor factor. The large industrial users in particular have avoided use of the futures market to hedge against inventory loss and have opted to accept the risks of changes in the market price.

A commodity exchange is in substance a forum where the participants are able to place bets that gold and other commodities will rise or fall in price within a specified period. The role of the clearing house association, a group of the larger brokers and dealers, is analogous to a combine of bookmakers who accept bets on horse races or sporting events and pay off when the bettor wins. Like good bookmakers the gold dealers are averse to gambling risk and consequently always seek a neutral position between contracts with long and short bettors. Since most of the public participants in the futures exchanges bet on price rises, i. e., contract for future delivery, the dealers, in taking the opposite side, find it necessary to acquire and hold physical gold in order to avoid a speculative position. The cost of carrying this gold is normally the spread between the spot price and the range of prices for future

delivery. It should be noted that the clearing house members collectively guarantee that every bet contracted by a member firm will be honored in full.

But an organized exchange is more than just a forum for wagering on trends in the price of gold. In addition to hedging facilities for producers and industrial users, a futures market offers a better procedure for those who wish to obtain an equity interest in gold than the cumbersome alternative of buying and selling physical gold in the spot market. On the futures exchange the actual buying and holding of gold, for future delivery required to balance the market, can be done more efficiently by professional dealers, with the gold then potentially available for productive use.

The normal pattern of spot and futures prices for a non-perishable commodity available in ample supply, such as gold, is roughly equal to the term structure of interest rates over the contract time span. If the spread between spot and futures prices were greater than the interest cost, gold would be bought spot and sold forward at a certain profit (in a given currency). If the spread were less, those who hold gold could sell it spot and buy forward at a certain profit. Professional dealers can profitably trade in the constant small deviations from this theoretical identity.

One caveat should be noted in the above analysis. The conclusion that the spread between spot and future prices of a commodity such as gold should logically equate with the term structure of interest rates is valid only if all of the dealings in the transaction are in a single currency. In that case the required assumption that cash is a risk-free asset is correct. But in a multi-currency transaction involving borrowing in one currency and a futures contract commitment in another, there can be no "locked-in" profit. For example a West German dealing in New York commodity futures must factor in the possibility of a shift in the dollar and the mark exchange rate during the term of his contract. This con-

sideration deters wide-spread international participation in any single futures market.

Futures transactions in gold in the European markets are not under a formal procedure based on government-approved regulations as in the United States but rather are private ad hoc arrangements negotiated with the various dealers. Prices for future gold delivery in all markets are, however, linked by world traders able to hedge against changes in the price of gold and the exchange rates involved.

A comparison with the silver experience indicates how an expansion of gold futures trading can potentially change the structure of the world gold market. Over the past decade trading in silver futures on the American commodity exchanges has come to totally dominate the world market. The massive volume of silver futures contracts traded, 100 million ounces or more in a single day, completely engulfs the physical transfer of spot silver which is only a minute fraction of this amount. An obvious result of this broad participation in the silver market is that the price has become highly volatile, frequently rising or falling 10 per cent or more over relatively brief periods of time.

There is one significant point about the behavior of prices in the futures market for silver as well as other commodities. It is this: the prices will tend to oscillate widely but within a rational context based on the realities of production costs and real industrial demand. Occasional price movements above and below this rational trading range tend to be short-lived. For example, over the past couple of years the spot month price of silver has for the most part fluctuated between four and five dollars an ounce. This is a rational 20 per cent trading range in terms of the real industrial world and can be expected to gradually move upward as production costs rise in future years.

At present the dollar amount of trading in gold futures is only a small fraction of silver trading, and on the average is less than the

amount of physical gold transferred in the major dealing centers. Although trading in gold futures influences the world price, it does not yet dominate the market. But this could change and rather quickly.

If, as in silver, gold futures trading becomes a multiple of physical dealings the pattern of the gold price will change. In recent years the price of gold has shown a few large changes followed by fairly long periods of little or no movement at all. But in an active futures market with broad speculator participation we can expect much more frequent and larger short-run price movements within practical maximum and minimum limits informally set by the market participants. For example, in the current context (mid-1976), if trading in gold futures were two or three times the prevailing volume we might expect the spot month gold price to move rather freely within a range of perhaps \$110 to \$150 per ounce, with daily movements of three or four dollars creating no great interest except among the actual traders. .

It seems likely that over the next few years trading in gold futures on the American exchanges will grow steadily with increasing participation by the speculating public. While this will mean greater short-run price volatility, it will on the whole be good for the gold market by contributing to a more rational pricing range in terms of realistic upper and lower limits.

Industrial Consumers

The great majority of industrial gold users do not deal directly in the gold bullion market nor do they acquire bar gold at all. Most of the gold for industrial use is purchased in semi-processed form -- plating salts, tubing, wire, findings, various alloys -- from a relatively limited number of gold refiners and processors. Only the larger firms have any direct contact with the gold bullion market.

The gold refiners, processors, and sellers of gold in various semi-

processed forms typically base their price on the market price for bullion on the day of shipment plus an add-on for the cost and profit of processing the gold into the form in which it is purchased.

All industrial holders of gold, bullion or semi-processed, bear a risk during the period in which they actually hold title to the gold. Because the price of gold was generally on the upswing until the past year or so, there was little incentive to minimize this risk through hedging or leasing. In fact the reverse was true. Many industrial users chose to maximize their equity holdings whenever possible by consigning rather than selling scrap gold material.

Over the past year this attitude has changed. Industrial gold users recognize that their profit depends on processing and selling a product not on commodity speculation. They are seeking to reduce inventory risks to the extent possible by keeping the quantity down and are exploring other available market facilities -- hedging, leasing, consignment, any device to shift the risk of ownership to others who are able and willing for a modest fee to take the responsibility.

However, with the exception of the major refiners, the large industrial users still hold substantial quantities of gold in exposed positions. Gradually many of them will reduce their equity in gold inventories through forward sale or a sale and lease-back procedure. The full development of this trend is dependent on a considerable expansion of trading in the gold futures market to provide the necessary financing and a ready outlet for dealers to adequately hedge their positions.

Government Gold Stocks

The governments of the world directly or through official international financial institutions now hold nearly 1300 million ounces of gold. This represents close to half of all the gold that has ever been produced and about 30 years' world production at the current rate. Every ounce of this total has been purchased in the historical past by one government or another at a price greater than the current private market was willing to pay.

Like the fable of the blind men and the elephant, the significance and potential economic impact of this great collective hoard can be viewed in different ways. One school of thought views government gold stocks as a perennial depressant on the market price. The potential or actual sale of large amounts from these stocks at any time, it is feared, will deter private investment in gold and even cause disinvestment of existing private holdings. This group tends to consider the actions of private investors as the dominant factor in the gold market.

A second very different view sees large government holdings as a potential support and even a possible plus factor to the market price. They reason that in order to protect the market value of their holdings governments will when necessary buy from each other or even in the market if necessary in order to raise the gold price to a level that will keep new gold production profitable. In short, this group of experts believe that governments individually or collectively, will act to sustain the value of their gold investment even if they have to spend every penny in the public treasury to do so. This can be considered the "pick yourself up by your own bootstraps" school.

A third rather ingenious view sees the potential sale of government gold as a constant stimulus to the market price. This reasoning holds that the risk of a large government sale at any time adds a cost factor

to holding gold which requires a higher constant market price than would prevail in the absence of this risk.*

A fourth down-to-earth group considers government gold stocks as akin to very low-cost mining reserves. As such they would be wheeled out of the vaults and sold in the market whenever the market price exceeds processing costs. This view is not widely held outside the Soviet Union and South Africa which act on this premise.

A final view, which includes most of the world's finance ministers, gives very little thought to the price of gold at all. The gold stock, like the office furniture, was there when the finance minister came and will be passed on intact to his successor when he leaves. The maxim that if a political action need not be taken it should not be taken, is on the whole pretty good statesmanship.

Which of these diverse views is valid? To a degree they all are, and therein lies the problem of properly assessing the ultimate relationship of government gold stocks and the world gold market.

Apart from these various theories and attitudes, it is useful to consider what facts can be applied to and deduced from the holding of government stocks of gold. One obvious fact is that the holding of gold by a government or anyone else involves a cost analogous to the cost of holding any other commodity in inventory. Gold is a non-earning asset and the annual cost of holding it is equivalent to the interest return that could be obtained by exchanging the gold for cash and investing the proceeds or retiring an equal amount of outstanding debt and reducing the applicable interest cost. A more direct way of putting this is that all government gold stocks in effect are financed through borrowed funds.

* The thesis is set forth more completely in a paper by Henderson and Salant, "Market anticipations, government policy, and the price of gold."

A second relevant consideration for government holders of gold is that its nominal monetary value cannot be held constant. The costs of producing gold and the demand of industrial users are the dominant factors in determining the market price and no government gold holders or practical combination of government holders can offset these factors for very long even if there were any rational purpose in doing so.

A third important fact is that government holders of gold stocks are by definition speculators. Any holder of gold, government or private, has an option at any time to exchange his holding for cash. Since there is a cost to holding gold, a decision not to sell implies a speculation that a sale at some future time will yield a return greater than the cost of holding the gold for the interim period -- which may or may not turn out to be true. In the real world, of course, government decisions to sell or not sell gold rarely have any such rational basis. The "speculation" implicit in continuing to hold gold is mainly due to political inertia. An obvious exception is the South African Government which as a matter of policy (and necessity) sells every ounce of gold that can profitably be mined. The reason for the apparent rationality of South African gold policy in contrast to that of other governments is that gold there is of sufficient economic importance to demand the full attention of policy makers. The South Africans simply cannot afford the cost and risk of gold speculation.

A final relevant fact for the gold policy of any government is that no holding of gold -- public or private -- can be considered permanent. This may seem to be stating the obvious but it is a point frequently overlooked by policy officials. The discounted present cost of holding any non-earning asset in perpetuity is infinite. It is, therefore, not a question of whether a given stock of gold is to be sold, but when and under what conditions.

Most of the world's governments hold gold in relatively small quantities which individually would not be sufficient to influence the market

price to any degree whatever their sales policy. A few governments, however, hold gold in large-enough quantities to be a significant or even dominant factor in the world market. The United States is an obvious example.

The United States acquired its stock of gold prior to the early 1950's through purchases from world-wide producers and prior holders of gold. These gold purchases were in essence an act of generosity if not charity to the rest of the world. The dollars acquired could be used to purchase American goods at by definition discount prices, or to invest in American securities. In the 1950's and 1960's the United States redeemed a large share of these dollars through gold sales but as a further charitable act refrained from raising the price. The net result was much the same as if a very large long-term non-interest-bearing gold collateral loan had been granted to the world in general.

At present the United States Government still holds a substantial quantity of gold as a sterile asset, nearly 275 million ounces, equivalent to 7 or 8 years' world production. In an earlier discussion of the interaction of the supply, demand, and price of gold it was concluded that at the current price in real terms (about \$125 in 1976 dollars) there is sufficient basic private demand above mining production to absorb the present level of South African, Soviet, and IMF sales plus a small but growing increment from other government stocks. Government gold sales in larger amounts could be expected to drop the real price (but not necessarily the nominal price). If government sales are reduced or held at the present level for a prolonged period of time the real price of gold would gradually rise as basic market demand increases along with rising real income.

The gold stocks held by governments are roughly equal to all remaining below-ground gold reserves on this planet. Evidence indicates that at prices as high as \$200 an ounce (in 1976 dollars) gold reserves which could be economically exploited would not be significantly larger.

With world industrial consumption approaching 40 million ounces a year and rising, and production rates not expected to increase even if prices were significantly higher, gold is among the few minerals for which alternatives are limited to sales from government or substantial increases in the real price.

Summary of Conclusions

Gold Production

1. Gold is among the world minerals in shortest long-range supply in terms of below-ground reserves extractable at real prices close to present levels.

2. The United States Bureau of Mines estimates that about 1.3 billion ounces (40,000 tons) of gold can economically be extracted from below-ground reserves at prices up to \$200 an ounce in 1974 dollars.

3. Gold will be produced only when and if it can be sold in a competitive market at a price that exceeds production costs.

4. Capital resources will be directed into new gold production only if the expected range of future prices indicates the investment will be profitable.

5. Gold production costs everywhere have risen sharply in recent years and on average are currently (mid-1976) close to the market price level. Production costs in future years are expected to rise at a rate at least equal to the world rate of inflation.

6. There is no reasonable prospect of a future rise in world gold production. Mining output has declined over 20 per cent since the historic high of 47 million ounces in 1970 and is expected to at best hold relatively stable over the next decade if there is no further decline in the real price.

Industrial Demand for Gold

1. Industrial demand is by far the major factor in the world gold market, absorbing about 85 per cent of all gold production over the past 30 years.

2. Industrial demand for gold has been highly responsive to changes in the real price, increasing more than threefold from 1950 to 1970 when the real price of gold was in substantial decline, dropping sharply in 1973 and 1974 when the gold price increased, and recovering in 1975 and 1976 when the gold price again declined.

3. Industrial demand for gold is also responsive to changes in real income. All other factors equal, the percent rise in industrial gold will tend to be roughly equal to the percent rise in real income.

4. At the range of gold prices in mid-1976 (\$120-\$130 per ounce), the industrial demand for gold plus the net off-take in gold coins is approximately in balance with total world gold production outside the Soviet Union plus all sales from official stocks. There is very little acquisition of gold bullion for speculation and investment.

The Supply-Demand Outlook

1. At a constant real price industrial demand for gold and the off-take of gold coins is expected to gradually rise over the next decade. With production at best holding level there should be an increasing margin for gold sales from official stocks. The present annual volume of government gold sales from all sources (about 10 million ounces) might increase to perhaps 25 million ounces in 1985 with no change in the price in constant dollars. A significantly larger volume of government sales over the next decade would probably reduce the real price of gold. If there were no increase in the volume of government gold sales the real price would probably rise.

2. Over the long run the average market price of gold will tend to gradually rise, frequently oscillating within a range of 20 per cent or so limited by average mining production costs on the low side and the choke point of industrial consumers on the high side.

The Gold Market

1. The bulk of world gold production is sold directly into the dealer market, primarily through Zurich and London.
2. Direct marketing arrangements between gold producers and industrial consumers (common in copper, aluminum, platinum, and palladium) are rare.
3. A free gold market with prices fluctuating according to changing supply and demand is a recent historical development dating only from March 18, 1968. Prior to that time the price of gold was fixed or strongly influenced by governments based on monetary considerations.
4. Less than 20 major dealers operating out of London, Zurich, New York, and Frankfurt handle virtually all gold bullion transactions in the world market acting as a point of convergence for buyers and sellers both in space and time.
5. World gold dealers, although they are in constant communication and trade extensively with one another, are highly competitive and work on extremely close buy-sell margins.
6. The major gold dealers are not speculators, and avoid open positions by balancing purchase and sales commitments to the extent possible.
7. Successful gold dealing requires a substantial source of capital and ready access to a supply of low-cost credit. All of the major traders are either banks, owned by banks, or have close working arrangements with banks.
8. The world gold market is new and in many ways different from the markets for other commodities. New trading practices are appearing regularly and the institutional structure of the market is being created by those who are participating in the day-to-day actions.

9. An important new market development is the spread of "leasing" arrangements by which gold formerly held in sterile private or government stocks can be made available for industrial use with a cash return to the continuing owner.

10. The United States is the newest and fastest growing part of the world gold market.

11. For reasons set forth in this report, the United States, with principal operations in New York and Chicago, is likely to become the largest of the world gold trading centers as it is for other commodities.

12. Speculative demand for gold has not been an important market factor except in two brief periods at the end of 1967 and in 1974.

13. Investment demand for gold is only marginal and is largely concentrated in coins. Most of the residual private gold hoard has been accumulated over a long period of time, is widely diffused among many relatively small holdings, and does not constitute a volatile "overhang" to the market.

14. The largest volume of speculative -- as well as industrial -- demand for gold is in the United States. In addition to annual bullion coin purchases of nearly 2 million ounces, American speculative interest in gold is expressed through futures trading on the commodity exchanges.

15. Although trading in gold futures is still only a small fraction of silver futures trading it will probably grow steadily with increasing participation by the speculating public.

16. The expansion in gold futures trading will tend to dominate the world price and will mean more frequent and larger short-run price movements.

Government Gold Stocks

1. Gold is among the few minerals that could reach a critical supply situation within this century, taking account of available reserves above and below ground.

2. The gold stocks held by governments are roughly equal to all remaining below-ground gold reserves on this planet and ultimately will be essential to supplying world industrial needs.



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